FINAL PROGRESS REPORT
Padua, 11/2015

Grant agreement number: MAppERS - ECHO/SUB/2013/661013

Periodic report: Final Progress Report

Period covered: 01/12/2013 – 30/11/2015

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2.1 Project Objectives

MAppERS (**Mobile Application for Emergency Response and Support**) dealt human sensors towards smartphone application (SA) in the context of prevention and crisis support for natural hazards. Citizens and volunteers were first actors of Civil Protection and the crowdsourcing created local and context-specific strategies of surveillance and territorial management. The SA was divided into two modules:

- MAppERS-V for volunteers (MP-V) module
- MAppERS-C for citizens (MP-C) module

Both the modules were re-designed according to methodological and logical testing gained during pilot study. People involved in training and piloting reached a long term objective of participation and crowdsourcing as actors of prevention of hazards, according to the priorities set by the Hyogo Framework, reducing costs of emergency management and promoting responsibility of the population. Training curricula for citizens and volunteers promoted awareness, territorial knowledge and specialized jargon to communicate hazard-relevant information toward smartphone.

An analysis on Graphical User Interface (GUI) adopted within SA for natural hazards offered a baseline of communication scheme for MAppERS frame. The usability handled efficiency, effectiveness and user satisfaction as parameters for design principle. The review strengthened criteria for layout, navigation, accessibility, icon setup and text guidelines design.

The development proceeded from Android 4.0 onwards, covering 82.6% devices as of today. The Web Application included a Cloud Architecture, a Relational Data Base and Web services, integrated with a Cloud Notification SDK to send push notification. The Mobile App Android included an app Skeleton, the communication structure (SMS, Emails and phone calls).

The bug-fixing and training was set during piloting and the crowdsource became a continuous source of development, testing and updating of each smartphone components. The wireframe contained a screen for registering and login common for both modules. The access and tools were then split for the two modules. MP-C proposed a *Personal Flood Plan* toolkit and *Crowdsourcing* reporting. Users were citizens voluntary registered and able to create own set of prevention measures and sharing geo-located information during critical step before flooding events. MP-V was a *Danger Survey* toolkit for rescue crew, useful to collect and organize real-time and standardized information for damages during crisis. The first draft of modules provided options to customize dropdown lists and sliding tools for end-users, enlarging the quality of the application based on local experts and witnesses.

Training courses on the monitoring of the territory and simulations of crisis events were necessary to reach a long-term objective of raising awareness and participation in hazard management among civil society. This strategy for the active participation of civil society as a primary actor in a networked risk reduction strategy, followed the priorities of action set by the Hyogo and Sendai Framework for disaster risk reduction, reducing the costs of recovery and emergency management and promoting a long-term policy of involvement of the population.

2.2 Partnership

National Research Council (CNR), Italy (Coordinator): it is a public organization; its duty is to carry out, promote, spread, transfer and improve research activities in the main sectors of knowledge growth and of its applications for the scientific, technological, economic and social development of the Country. **Institute of International Sociology Gorizia** (ISIG), Italy: it is a is a cultural non-profit association participating in public tenders promoted by organizations and agencies at regional, national and international levels concerning the mobility of knowledge and researchers through the active participation, regarding territorial planning and risk management. **Hellenberg International OY** (HELLB), Finland: it is an international security advocacy based in Helsinki and Hong Kong. With a compact and flexible in-house research unit, it challenges mainstream solutions in critical infrastructure protection. The team supports governments, international agencies and corporate clients in mitigating effects from various risks, among others natural disasters. **Estonian Academy of Security Sciences** (EASS), Estonia: it is a state institution, providing professional education for civil servants belonging in the area of government under the Estonian Ministry of the Interior. The Academy established in 1992 is the only educational institution in Estonia, which trains specialists in internal security and law enforcement. **Frederikssund-Halsnæs Fire & Rescue Service** (FHFRS), Denmark: it provides fire and rescue services to the municipalities of Frederikssund and Halsnæs in the centre of Seeland, in Denmark. The two municipalities are home to approximately 76,000 inhabitants who live within a land area of 382 square miles. **Helsinki City Rescue Department** (HCRD), Finland: one of the 22 regional rescue departments in Finland. The only one operating in the area of a single city or municipality. It is responsible for carrying out tasks such as monitoring and inspections of fire prevention measures, fire and rescue operations and medical rescue operations in the Helsinki area.

2.3 The expected results and deliverables

The following list summarize the expected results of the Project:

1. easy-to-use "human-data" input on crisis management;
2. development of a multi-module tool (SA) to be used as communication device between population, civil protection volunteers and headquarters during phases of preparedness and emergency;
3. utility of geospatial response to maximize in a model of peer-produced mapping (e.g., damaged points, critical hotspots) with the most up-to-date information;
4. development of a strategy of disaster prevention that is more cost-effective, prone to human and social resources within communities rather than investing on new structural and large-scale mitigation options;
5. long-term involvement and participation of the population in the prevention phase on the territory, so to reduce social, human and economic impacts of hazards.

3. General summary of project implementation process

The project designed and tested a SA for emergency response and support. Information exchange and data transfer had to be as clear and efficient as possible. Research investigated methodologies, state-of-the-art of practices and data sharing techniques already adopted for territorial management. Citizens and volunteers of civil protection were involved to test MAppERS at pilot sites. The SA were re-designed according to usability and technical feedback gained during pilot study. Training curricula for citizens and volunteers that wish to be involved in the monitoring of the territory in the long-run were developed, to promote territorial knowledge and awareness, offering technology to communicate emergency relevant information. A synchronized platform allowed both the protection of private data from citizens and the identification of the users in case of misuse of the information sharing.

The time schedule respected the initial planned in the agreement with specific updates:

1. Production of training curricula and policy recommendations were postponed, giving priority to a thorough piloting activity, the core action of the project that was deemed fundamental for bug-fixing, and for increasing conceptual efficiency and completeness of the devised apps.
2. Piloting started with EASS for a testing of draft smartphone version within a real simulation in Tallin (Estonia). The activity guided a final line of development based on concrete requirements within case studies.
3. Piloting with HCRD and FHFRS had a parallel proceeding, linked to separate requirements. The smartphone provided two modules separating citizens and volunteers supplies based on singular roles within crisis managements.

4. Evaluation of project management/implementation process

The opportunity to collaborate with rescue services as project partners was a positive aspect, combining professional actions on field with quality improvement by tools and services of smartphone solutions. A research analysis within existing smartphone experiences about preparedness and awareness at international level provided a large review of structural database, communication systems and data transferring. A gap between scientific institutes and local communities within risk management depends by languages and technical terms. The convenience of translation in local language by automatic tool enables the involvement of local inhabitants, improving usefulness of terminology within technical devices. The direct involvement of citizens and volunteers enlarges the efficacy of a strategy for long-term disaster prevention. The partnerships cooperation implied a distribution of roles based on each partner's experiences and interests.

The network among partners was implemented as planned within the grant. Relations between scientific institutes and end users within the consortium was essential, so to keep integrating practical technical insights and requirements in technological development, adapting technology available with territorial management needs. The aim of this process was a participatory developed technology, tested for usability by users. The customization might offer a European value for new case studies and parameters to be included. Functionalities and tools of the apps could be updated for both smartphone and dashboard

Rescue service activities are context specific and embody the local approach of a given community towards emergency management and population's involvement. Thus, the efficacy of a framework including a smartphone solution cannot be independent from approaches and techniques adopted at the local scale.

Piloting activities implemented throughout the project ensured the efficacy of the Smartphone Application (SA) development, merging the functionality with improvements suggested by final users. Final users' (citizens/volunteers) feedbacks had a direct effect on SA development. While contents and activities of the initial SA's development complied with rescue service requirements, testing allowed for the modification of the app according to citizens and volunteers insights.

The customization of smartphone components was the starting approach to optimize the output after piloting. Feedbacks from citizens and volunteers included a list of malfunctions and potential progress upgrading steps. In addition, testers' feedback was precious in terms of content's upgrade. Dashboard is Web interface of a framework for crowd contribution towards field activity. The data collected depends on modules tools and data request, whose structure and purpose was refined by feedback during piloting. The SA recommends new text box within specific menu list and dashboard visualize new text for on-going review by rescue service.

5. Activities

Every activity initially planned is detailed within milestone and deliverable available online and in Chapter 6. The activities cover the period from 01/12/2013 to 30/11/2015, in respect of the range period in T3b - Task Form, as following listed:

Task ID	Task Title	Start Date	End Date	Duration	State
A	Management and reporting to the Commission	Dec-13	Nov-15	24	Completed
B	Building on preliminary research	Jan-14	Aug-14	8	Completed
C	Development of smartphone application	May-14	Sep-15	17	Completed
D	Creation of pilot groups	Feb-14	Jan-15	12	Completed
E	Pilot testing	Jul-14	Sep-15	15	Completed[1]
F	Production of training curricula	May-14	Sep-15	17	Completed[1]
G	Policy Recommendations	May-15	Nov-15	6	Completed[1]
H	Publicity	Dec-13	Nov-15	24	Completed

5.1 Comparison of activities

Activities - Task A
Planned
The Grant Agreement contained a timeline for milestone and deliverables, Plan of Action and Document of Work had to ensure information sharing. Mid-term Meetings and Final Meeting had to monitor and offer a transparent project manner with EC representative. Network within consortium had to be coordinated, interacting continuously with EAB ensuring targeted aims. Mid-Term report had to list progress of project, evaluate activities, networking and coordination actions. Final report has to be prepared and sent to EC, including list of products and contributions of partners.
Implemented
10 members of civil protection, research institutes and international companies formed the EAB, regularly invited to project meetings by HELLB. Efficient feedback by EAB evaluated continuously data management, tools for communications and steps of development, provided and updated within simulation of crises events. MAppERS enlarged EAB meetings with Finnish Meteorological Institute and Gothenburg fire and Rescue Services (EAB members) in brainstorming for improvements and future activities. Elisa Corporation provided the idea to integrate the benefit of social media for awareness. European Severe Storms Laboratory suggested a more self-explanatory interface, which guides users (either volunteers or citizens) through the questions, reducing data filling requests, particularly during crisis. CNR proposed jargon simplicity within data types due to own risk management experience. First Mid-Term Report and Second Mid-Term Report collected state-of-art supported by EAB, regularly invited with EC. Single reports included completely the progress of developments and proceedings improved by single partners. Piloting collected several data control and bug-fixing experiences for smartphone progress of work. Dissemination was uploaded constantly by web site and emails.

Activities - Task B
Planned
The basic objective was the analysis of existing experiences in terms of technologies and communication within aims of disaster management, including European projects and partners' experiences. Existing case studies for environmental and social impacts required interviews and workshops with EAB members. A Strength Weaknesses Opportunities Threats analysis (SWOT) would have to identify potential improvements for disaster management within pilot countries, considering the data gathering techniques.

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[1] Task E, Task F, Task G were planned to start with a first strategic draft piloting in June 2015 during "Sireen Rescue Service" simulation in Tallin - Estonia.

The review of disaster management in pilot countries had to highlight existing Database Management System DBMS, describing how to highlight the information among volunteers and citizens. The research had to analyze how treat the information within crisis phases and real-time measurements. The experiences within pilot countries had to clarify how the development could be adapted to existing architectures. Best practice on design and communication tools had to plan graphic user interface (GUI) for smartphone development.

Implemented

An analysis within partners maintained a common scheme about civil protection experiences and crisis managements. The organizations appeared well detailed with an evident focus on awareness and communications tools. The scale of actions was fundamental to highlight their roles and responsibilities. A SWOT scheme was prepared including parameters for civil protection, especially devoted on capabilities, knowledge dissemination and risk awareness. The analysis was set but transferred within single piloting, more devoted to their practical approach on emergency and risk management. Analyzing ongoing and past EU projects the first part of research has been focused on prevention and mitigation strategies (dealt 'soft approach'), based on policy making, risk awareness, tools for available information. The review included 8 European projects, describing how the insights could be built-in MAppERS. For solutions of recovery costs reduction, only 3 European projects appeared useful. MAppERS could amplify the potential of mobile data sources for territorial monitoring including volunteers and citizens involvement. The national DBMS in pilot countries showed existing tools for data collection and monitoring, including volunteers and citizens. The approach of CNR for MAppERS was a synchronized database, customizable with web-sharing information. MAppERS delivered a structure to update database, not overlaid, but integrating rescue service efficiency. The rapid availability of key-information harmonized MAppERS utility, including citizens as human sensors. The design was a not-invasive framework (customizable toolbox) but synchronized with internal roles of partners. An advance of MAppERS included a geo-located tool according to official Registry Offices for a local real-time capacity. Best practices on design and sharing/communication tools appeared after a detailed review. The design of a GUI was fundamental including the visible content (i.e. images, texts, menus), the structure beneath it (i.e. links of elements), and options for user. A detailed report defined with accuracy the most functional and user-friendly solutions for MP-APP. The surveyed SA revealed details and baseline for MAppERS development (50 SA selected with specific GUI index). The analysis defined in detail layout for skeleton and graphical elements required for surface plane. A detailed report included usability, parameters and principles of design.

Activities - Task C

Planned

The objective was the development of SA, collecting on-site information within phases of crisis management. Crowd-sourced tools had to provide data gathering, adaptable with available public database within pilot study area. The Software Development Kit (SDK) had to implement solutions within iOS and Android environments for a massive market. Criteria, ontology and jargon had to guarantee useful and easy-to-use interfaces, provided by research and evaluation of external usable solutions. MAppERS had to deliver two modules, MP-C for citizens and MP-V for volunteers. A continuous test during piloting offered feedback on bug-fixing, usability and contents. The upgrade had to complete functionality and stability. The evaluation of the activity required an interface for rescue services, to test usability and application efficiency. Knowledge of technology solutions for emergency and prevention management had to collect available application and strategies within pilot countries. A report had to highlight aims and solutions adopted as baseline. A review on SA had to provide solutions for centralized webserver/database and existing data loggers in pilot areas. A scheme of communication and application had to follow ontology and visualization criteria analyzed. Data list had to provide workflow of information within modules of SA. From Task B a communication scheme had to establish customer communication based on technology and ontology rules. The information collected had to assemble a flowchart with pull-down schemes. The know-how for SDK had to split two modules for dataset and DBMS. Designing of tools had to be tested and applied for both modules, including tools for single profiles management. Both modules required testing

within pilot areas for usability, simplicity and efficiency of the application. The feedback had to include bug-fixing, completeness and end-user schemes for updates.

Implemented

SA for disaster management appeared copious within feedback of pilot countries, hosting technologies not largely available between citizens, but as new tool accessible for volunteers groups. On the other side, real-time field surveys appeared as a vast new trend in northern Europe achievement, including goals of communities' involvement, but without practical new examples within rescue services.

An examination of mobile technologies available in pilot countries revealed functionalities and related aims. Each country had specific methodologies concerning OS solutions within internal legislation. A table in the report offered a comparison between dates of development, SDK, general descriptions and targets. The GUI provided layout, navigation, colors, icons and text adopted. The analysis was carried out for data collected, communication system and graphic framework. CNR and ISIG identified the targets of efficiency, effectiveness and accessibility selecting SA at global level. A breakdown on number of users provided broadcasts for single App and influence of the surviving solutions. A high percentage of available keys did not complete the basic usability. Furthermore, the positive experiences provided criteria for architecture and wireframes. Systems of data loggers evaluated within pilot countries depend on public architectures, and therefore MAppERS provided a framework to avoid overlay. Crowd-source tools within modules involved large responsibilities on customization, as long-term improvement on preparedness. Engineering for MAppERS Application (MP-APP) portrayed steps of Project Plan (MP-C access for citizens, MP-V access for volunteers and Admin access to both modules). Web Application offered a cloud of services for data treatment. Mobile App Android was the complex development compatible with Android 4.1 and higher. The customization with Android SDK environment was the architecture adopted for development. iOS required a longer time to let the slides be available online, reducing the scientific timeline. CNR completed the issue of technological development and scientific methodology. Testing during piloting completed bug-fixing and regularly upgrade for the final version. Iteration offered regular releases after every update. Indicator of performance was a post-implementation review with piloting feedback. The output was a completed architecture with MP-V, MP-C and dashboard for data analysis. The dashboard provided an advanced web application for rescue services, based on MP-APP architecture. Data collected during piloting appeared in real-time. The access had single profiles synchronized with MP-APP, available for MAppERS Consortium. Piloting testing for MP-APP was enlarged simulating rescue service with dashboard and DB updating in real-time was advantageous. Open source and data upload by end-users provided final MP-APP architecture, customizable, efficient and tested. The completed framework had an easy-to-use interface derived by a vast research in Task B.

Activities - Task D

Planned

The task was originally planned to:
- Allow for the identification of pilot areas, through End Users Advisory Boards (EAB) and partners' networks;
- Allow for the selection of pilot group participants;
- Organize focus groups/meetings with testers to prepare them for the piloting exercise.

Implemented

This task set the basis for the implementation of the piloting in each end-user partner country. The pilot proceeded from a consortium brainstorming in Padua at (Kick Off Meeting, on 4 March 2014) and developed through in-depth interviews with representatives of HCRD and FHFRS and in collaboration with EAB. Carried out by ISIG and CNR, the interviews aimed at identifying the outreach possibilities of each operative partner, in terms of volunteers and citizens, and the potential domain of testing they could provide. The interview-based data gathering was followed by a more specific definition of roles, competences and piloting dates during the Mid-term Meeting held in Gorizia on 8 April 2015 and conducted by ISIG. During this meeting also insights from EASS were gathered on their outreach potential for piloting, to be held during a Rescue Service International Exercise. EASS, HCRD and FHFRS contacted

their volunteers, students and involved citizens in the activities organized for the testing of the 2 apps. Feedback forms were prepared by ISIG for both MP-C and MP-V. The feedback forms are composed by a screenshot of each of the app screens, and a feedback box where guiding questions have been inserted for testers to give their insights. The feedback forms were distributed to partners as standard data gathering template.

In order to ensure data protection and informed participation of testers to the piloting, dedicated consent forms were prepared by ISIG to be distributed to all partners. During Mid-term meeting in Gorizia, partners were introduced to the functions and use of consent forms and instructed on how to inform testers. All testers to the MP-APP be them citizens or volunteers, received detailed information on the scope of the testing and on the use of their data (for research purposes) and their storage. All testers have signed an informed consent form (template attached as Annex II to this document), that is stored at partners premises. EASS, HCRD and FHFRS, supported by the material provided and following preparation done during Action D.1 organized dedicated meetings/workshops with citizens and volunteers for the presentation of the MP-APP prior to their involvement in the testing.

Activities - Task E
Planned
The planned action consisted in testing MP-APP prototype by using it during testing sessions with possible end-users. To improve the reliability and usability of the MP-APP indications from surveys compiled by participants of the testing sessions had to be collected. These actions had to be implemented both for MP-C and MP-V, modulating the focus group participants to reproduce the actual target of future users. On the basis of the results of the survey the MP-APP had to be updated and optimized in order to implement main recommendations. Comparative analysis on testing sessions carried in different countries had to be undertaken.
Implemented
Testing of MP-C and MP-V (Estonia) - 11 June 2015 Rescue School in Väike-Maarja organized a practical exercise for graduating courses (called "Sireen"). In 2015 it took place on 11 June and involved more than 90 students of EASS and rescue schools from Finland, Poland, Germany, Latvia and Lithuania. Together with rescue and police, also ambulance services were involved in to the exercises and medical field hospital was set up. Road accidents, crisis where water or rope rescue is needed, chemical spills, collapsed buildings, fires and other incidents were simulated on the training ground. This use of the MP-C and MP-V was finalised to a training purpose. The asset of the app that was tested in this context relates to its potential as a training tool for students who are in the process of becoming Civil Protection professionals. The purpose of the first test was to check whether MP-APP could be a reliable and stable tool in addressing the attention for students towards certain specific elements of risk/danger and identify the main data to be reported in an emergency situation. A first bug-fixing and usability control was made on the draft version for both MP-C and MP-V. CNR participated with the first release of MP-C and MP-V. The piloting was organized and maintained during the practical exercise. Students had specific responsibilities within exercise and MAppERS maintained a not invasive role. The approach was not invasive, integrating the capacity of rescue services. The feedback was complete for both MP-C and MP-V. **Testing of MP-V (Finland)** - 25 August 2015 The piloting exercise in Helsinki was created together with Tammisalo Voluntary Fire Brigade (TVFB), which is one of the supporting contractual units in the City of Helsinki. Four members of the TVFB agreed to work as the actual testers during the agreed time. The scenario for the testing was a storm situation where 112-center (emergency control room) could (would) be overstretched and the prioritizing of the queued alerts / operations would be needed. In order to obtain relevant information from the affected areas, HCRD decided to mobilize voluntary fire brigades. The MP-V tool was to be used as the reporting tool / line to the HCRD operations centre. On 25 August 2015, HCRD introduced the project to TVFB training personnel on the idea of the MP-V software and its use. At the same time, HCRD provided TVFB with the smartphones

acquired by the project (distributed by CNR to partners during the Mid-term Meeting. The phones remained at the use of the TVFB as their property, also after the piloting was finalized. The piloting took place on 1 September and was combined to TVFB's weekly training exercise. Four individual pilot testers did observations within the operational (geographical) area agreed while planning for the piloting. The time during which the testing took place was between 1800hrs and 2100hrs. The timing was agreed beforehand, according to TVFB normal training schedule. CNR designed tools and contents for MP-V. Testing was involved within squads of rescue service. Piloting revealed controls and a practical utility of MP-V. Volunteers provided a large database during piloting, for bug-fixing responsibility and content control by customization tools. The dashboard was a practical improvement, available for simulation of rescue managers to control volunteers in real-time and upgrade content for MP-V.

Testing of MP-C (**Denmark**) - 30 September 2015
The piloting at FHFRS involved citizens and thus MP-C was tested. In order to effectively work with citizens and overcome linguistic barriers, MP-APP was translated into Danish for the purpose of this piloting. The exercise took place in in Frederikssund on 30 September 2015. The citizens (10) that took part ranged from 18 to 65 years of age, and after the presentation of the project, were divided in 2 groups. One group was trained beforehand, on how to use MP-APP. The other group was not trained and directly involved in the testing without prior technical information. CNR designed tools and contents for MP-C. Testing involved local citizens of different ages and training, testing positively the usability of Danish tools. CNR managed with FHFRS the piloting in Frederikssund and supported citizens in the training activity. Citizens provided database during piloting, for bug-fixing responsibility and control of content. The dashboard tested efficacy of geo-location distribution for each citizen, providing a real-time update, synchronizing crowd-sourced data with local Registry Office.

Activities - Task F
Planned
The task was originally planned for the creation of training curricula for citizens and volunteers that are interested in the long-term disaster prevention strategy envisaged by the project. These courses were planned to provide training both on identification of physical elements of risk and on the use of SA device. The task was meant to prepare and test training materials, and to identify the most suitable training methodology. Video tutorials were planned on specific topics and uploaded on the project website.
Implemented
This task developed video tutorials for the use of MP-APP and a booklet accompanying the videos, as means of training curricula and materials. These tools can be downloaded from the project website and guide both volunteers and citizens in the full exploitation of the app potential. The use of online video tutorials as means of training materials was discussed with partners and especially with EASS, which tested the tool with its Civil Protection Academy students and deemed these tools more 'catchy' and useful. In addition, this strategy makes the training less dependent on professional trainers that can in this case act as a support, but are not the only sources of knowledge. This on one side reduces the cost of training, and on the other makes territorial mapping awareness open to a wider public. In addition, having video tutorials available online allows for further feedback from users/wider public. This in turn is a value added for the further upgrade of the app. Action F.1 (Identification of objectives of training) and F.2 (Identification of trainers and coaches) were undertaken by ISIG in collaboration with CNR, FHFRS, HCRD and EASS prior to, during and after pilot testing. These preliminary actions (workshops, skype call interviews) were aimed at identifying the main topic of interest in terms of training that MAppERS could provide. This resulted to be the app itself, both as a tool for volunteers of reporting of geo-localized, precise data to headquarters/control rooms (in HCRD experience), and as means of raising awareness among the citizens about their possibility to actively contributing to territorial mapping and risk management (in FHFRS experience). Also, as EASS experience suggested, the testing of the app itself could be a relevant topic of training for professional civil

protection/rescue service staff, that thus could experience on the filed what works and what does not work in terms of effective smartphone communication of risk and emergency.

These tools were tested with end users partners and were presented to local civil protection units in Italy (Regional Civil protection Department in Friuli Venezia Giulia, Municipal CP units of Lignano Sabbiadoro, Gorizia, Sagrado, Staranzano during and prior to Final event of ECOSTRESS project, to whom MAppERS team leader participated and illustrated video tutorials). They were evaluated as very useful training tools, to be inserted in civil protection training modules. Civil Protection professionals deemed the testing of the tool in itself as a relevant training activity for volunteers or for students that participate to risk awareness campaigns. Further translations can be made available on request, but so far EASS and HCRD deemed the English version as sufficient for their target areas.

Activities - Task G
Planned
This task was originally planned to deliver a Policy Recommendation report, summarizing projects' lessons learnt in relation to the use of SA for Disaster Risk Reduction (DRR). The Policy Recommendation report had to be used both by local authorities, civil protection managers and EU institutions as means to connect practical project experiences and feedbacks to EU/regional/local goals in terms of DRR.
Implemented
The activities carried out within this task are summarized in a Policy Recommendation Report. Its purpose was to report project insights vis-à-vis Sendai Framework and relevant corresponding EU frameworks. The main topics identified related to lessons learnt and potentials for transfer for what concerns: - Stakeholders involvement in DRR; - Use of smartphone technologies and crowdsourcing as means of empowerment of civil society; - Training of citizens and volunteers as key of awareness raising policies and self-responsibilisation; - Multidimensional approach in tackling risk management. The data gathering for this report proceeded from: - Literature review on relevant international and EU frameworks; - Insights gathered from exchange with End Users Advisory Board; - Summary of project insights/lessons learnt; Workshops with stakeholders and project partners during MAppERS final event (26 November 2015) to gather their insights and feedbacks on project results and potential future developments.

Activities - Task H
Planned
The task was originally planned to deliver: - A common dissemination strategy, also involving stakeholders and end users in the dissemination process; - A project website - The organization of a final dissemination event of project results.
Implemented
A Communication strategy was drafted within one month from the official start of the project. It contains guidelines for dissemination (according to visibility rules set forth by the EC), and templates for internal and external communication (within and outside the consortium), namely the files of: PowerPoint presentations, reports, project team and EAB members business cards, MAppERS brochures posters and roll-ups. All materials were produced as annexes to the report and made available to all partners in the project partner area.

It also identified target groups for different dissemination events and a timeline of potential public events to be realized within the project lifetime. It contained guidelines on the projects' online platforms (website, socials) and tools (Dropbox).

A complete list of all dissemination events attended by Project partners and organized within Project's lifespan was included in the Communication strategy Report. A final public dissemination event was organized in Padua on 26-27 November 2015 to present the Apps. It involved stakeholders as well as scientific community. A further presentation of project results was done during DGE ECHO ECOSTRESS meeting held in Gorizia on 11 December 2015.

Following the consortium willingness to exploit project results further and identify strategies for an effective follow-up of MAppERS activities, ISIG created a new section in the MAppERS Communication Strategy dedicated to exploitation. The updated report is available on project website and capitalizes on all the information gathered during project proposal, partner and extended network insights on exploitation potentials.

The website **www.mappers.eu** was created one month into the project lifetime. In addition, from what was foreseen at project's beginning, also a Facebook (**Mappers**) and Twitter (**@MAppersEu**) dedicated accounts were created and integrated one into the other in order to ensure greater visibility. A Linked- In MAppERS group has also been created (**https://www.linkedin.com/groups/7474410**), including all researchers and partners, as well as members of End Users Advisory board.

6. Technical results and deliverables

The aim of this report is to inform European Commission (EC hereafter) on tasks and activities completed within MAppERS project in the project period. The Final Progress Report includes the following annex:

- Financial Summary highlighting the project expenditure incurred until the progress report.

Every deliverable, milestone, service and output provided is published on the official MAppERS web site partners area (password protected). Information for EC is available at:

- Web site: http://www.mappers.eu
- Password (for partners area): mappers
- MAppERS App download in partner area: http://goo.gl/ttMkn5
- Dashboard access: http://goo.gl/lqtbzd

In the project period, the partners continued to make progress in the development and updating of the application and piloting organization:

1. The MAppERS smartphone application (MP-APP) has been created with two distinct modules for citizens and volunteers (MP-C and MP-V);
2. The pilot areas have been selected;
3. The EAB members have been identified and divided into three distinct subcommittees;
4. Partners have agreed on the organization and deadlines for piloting groups, finalizing the commitments during the Mid Term Meeting in Gorizia (MTM);
5. The internal communication within partners is ensured thanks to a dedicated e-mail and to the constant update of the webpage and Partner Area with documents, templates, files, deliverables, and reports.

The main goals were structuring the MP-APP (Graphical User Interface and Dashboards) and updating the application according to the feedback provided by partners together with the organization of Piloting groups

and EAB (end Users' Advisory Board) involvement. Piloting is essential to ensure the needs of the end-users' are heard and took into consideration in the finalization of the MP-APP structure.

Hereafter single reports about research issues in this project period are listed and linked with deliverables and milestones for single task. Every report is available for download in partner area on MAppERS website. Name of responsible partners is indicated.

Task A – Management and reporting to the Commission

The task collected output and organization of each single meeting and event in MAppERS project.

Task: **A** – **D**eliverable n. **1**: Report Kickoff Padua		CNR-HELLB
Description of deliverable	Technical kick-off meeting, Padua, 4 March 2014. CNR introduced aims and issue of the project, included in the general overview. The report represented D1 - Document of Work 1/3.	
Purpose of deliverable	Providing a common direction with administrative and financial issues.	
Evaluation of deliverable	Roles of partners defined. Network and dissemination planned for scientific aims.	
Value-added of deliverable	n/a	
Dissemination	Links: - Report Kickoff Padua: http://goo.gl/Re18oI	
Deviation from the DoW	No deviation	
Explanation	n/a	

Task: **A** – **D**eliverable n. **2**: Report Meeting Helsinki		CNR-HELLB
Description of deliverable	Stakeholder and End-user Meeting, Helsinki, 14-17 May 2014. It was the starting MAppERS project presentation by CNR directly to HCRD personnel. Discussion included the potential for the project in the HCRD's view and rescue services rules. The report represented D1 - Document of Work 2/3.	
Purpose of deliverable	Legislation and strategies of local rescue services clarified. Presentation made by CNR and HELLB introduced aims of toolbox advancement and role of EAB before development and testing.	
Evaluation of deliverable	HCRD emerged fundamental for their experience on field and volunteers organization. DBMS was directly planned with squads of volunteers.	
Value-added of deliverable	Dissemination of internal data management (techniques and responsibilities), fundamental for development.	
Dissemination	Links: - Report Meeting Helsinki: http://goo.gl/L0wI7n	
Deviation from the DoW	No deviation	
Explanation	n/a	

Task: **A** – **D**eliverable n. **3**: Plan of Action		HELLB-CNR
Description of deliverable	Mappers EAB had to facilitate the role of end users requirements, professional testing and monitoring the projects results. EAB had to be invited to participate in project dissemination as key-points to outreach external organizations. The report represented D1 - Document of Work 3/3.	

Purpose of deliverable	Participating in Mappers meetings the EAB focused how MAppERS output could be used within most demanding emergency response environments.
Evaluation of deliverable	EAB members enhanced their professionalism increasing their network within MAppERS concepts.
Value-added of deliverable	EAB feedback was useful organized in administrative and societal outcomes based on experience integrated on MAppERS aims.
Dissemination	Links: - Report Plan of Action: http://goo.gl/ckOlQA
Deviation from the DoW	No deviation
Explanation	n/a

Task: **A** – Deliverable n. **4**: Progress Report		CNR
Description of deliverable	M13 - Mid-Term Consortium Meeting and D4 - First Mid-Term Report are presented as 1st Progress Report, combined in a single action but separated to be visible. Structures of reports are similar, including proceedings about technical progress. 2nd Progress Report represented D6 - Second Mid-Term Report.	
Purpose of deliverable	Continuous reporting of scientific advance.	
Evaluation of deliverable	Progress reports had a proceeding structure, to let single proceeding visible and new output.	
Value-added of deliverable	n/a	
Dissemination	Links: - D4 - First Mid-Term Report: http://goo.gl/yicT6E - D6 - Second Mid-Term Report: http://goo.gl/I55UPY - D12 - Final Report	
Deviation from the DoW	No deviation	
Explanation	n/a	

Task B – Building on preliminary research

This task included the theoretical basis and collected context-specific information to proceed with smartphone development. Fundamental was the research about prevention strategies, graphic solutions and DBMS adopted within other smartphone solutions within risk management.

Task: **B** – **D**eliverable n. **1**: PREVENTION STRATEGIES/COSTS DATABASE		ISIG

Description of deliverable	The report summarized the findings of desk-based research on EU projects on prevention and of relevant SA surveyed to this end. The original work plan from DoW implied a focus on literature review of projects' results. The discussion with partners as well as EAB members oriented the document outline towards a different focus. Thus, the review of costs of recovery and overcoming strategies was inserted in report B1, while report D.B.2 contains 2 different inputs:
	- on the one side, a set of 'lessons leant' from previous prevention-oriented projects:
	    a. to define a relevant pathway for MAppERS development;
	    b. to set the basis for the Policy Recommendation report.
	- the summary of a survey on previous and ongoing projects and scientific efforts aiming at developing and implementing smartphone's application solutions:
	    a. to layout the basis for MAppERS technological development.	

Purpose of deliverable	To build on already existing knowledge and extrapolate useful insights form already implemented projects/applications.
Evaluation of deliverable	The report has contributed to shape clear outline of insights to be taken into account in the development of policy-related aspects of MAppERS. In addition, the survey on available applications and their comparative analysis has set the basis for the state-of-the-art in-depth research on smartphone applications' potentialities and limits. The ultimate aim was to capitalize on existing knowledge and best practices for an efficient technological development process within MAppERS.
Value-added of deliverable	The value added of this report is its easy-to-use approach, which focused on the main topics of interest of the consortium's work. This work also sets the baseline for Policy Recommendation (Task G) as well for the MAppERS own app technological development.
Dissemination	The report was used as an internal document targeted mainly to partners and was published on the project partner area accessible from the MAppERS website. Links: - M4 - Prevention projects & Cost Database: http://goo.gl/RXKKlY
Deviation from the DoW	The original work plan from DoW implied a focus on literature review of projects' results. The discussion with partners as well as EAB members oriented the document outline towards a different focus. Thus, the review of costs of recovery and overcoming strategies was inserted in report B.1, while report D.B.2 contains what described above.
Explanation	In order to avoid duplication with report B.1 this slight shift on the scope of the paper has been applied.

Task: **B** – **D**eliverable n. **2**: GRAPHIC SOLUTIONS		ISIG-CNR
Description of deliverable	State-of-the-art of existing SA for emergency management and preparedness. CNR completed a research on communication methods and graphic solutions, combined with SA linked to on-site database. The GUI examples of usability analysed by ISIG towards layout, navigation, colours, icons and text adopted, provided a guideline for the development of Action C.4.	
Purpose of deliverable	Collecting SA, adopted in emergency or hazard context. The analysis was for data collected, communication system and graphic framework.	
Evaluation of deliverable	The analysis tested efficiency, effectiveness and accessibility, finally selecting 51 SA at global level, classified for parameters assumed. An interesting breakdown on number of users for single application provided distributions and influence of the surviving solutions.	
Value-added of deliverable	The delivery of emergency-relevant information (i.e. the operators' perspective) was not the only aim, but also to the accessibility of the tool especially for citizens. Thus, the 'citizens' friendly' approach was accurate with graphics and communication codes. A large number of technologies reviewed for rescue services a high percentage of available smartphone solutions, not complete for a basic contest of usability. Collecting positive experiences CNR provided basic rules for architecture and wireframes adopted within Action C.4.	
Dissemination	M8 - STATE-OF-THE-ART OF APPICATIONS, M5 - REPORT ON STATE OF THE ART and M9 - SET OF GUIDELINES FOR ACTION C4 are merged in one report because of their mutual scientific dependency. Links: - Report on Desk-Based Graphic Solutions and Smartphone Applications: http://goo.gl/FWrPFD	
Deviation from the DoW	No deviation	

Explanation	n/a

Task: **B** – **D**eliverable n. **3**: STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS ANALYSIS (SWOT)	HELLB
Description of deliverable	SWOT analysis was carried out along the report of overview of the civil protection system in the MAppERS pilot countries (Denmark, Estonia and Finland). This analysis described the strengths, weaknesses, opportunities and threats of the national civil protection systems. The report highlighted and compared the civil security mechanisms in the selected pilot countries. It described first historical, societal and cultural aspects of the civil protection systems (including cases, which have affected the development of the civil protection arrangements). It covered the responsibilities and functions in civil protection area in the selected pilot countries, as well as aspects related to awareness and communication of risk. The pilot countries have been selected as representatives of the essential civil protection stakeholders in the MAppERS project. These are Denmark (FHFRS), Estonia (EASS) and Finland (HCRD). Italy is also included in annexed data and SWOT assessment as the MAppERS project includes also Italian research institutes: ISIG as project partner and CNR as project coordinator. The country reviews are composed of four chapters: general framework for civil protection, historical, societal and cultural aspects of the civil protection system, responsibilities and functions in civil protection and, finally, situational awareness and communications in civil protection.
Purpose of deliverable	The technical experience within piloting countries offered a fundamental background for next steps, composed by crisis management organizations described as tools, techniques and especially directed to communication system avoiding overlapping of codes and not innovative toolbox for local rescue services. SWOT analysis, based on the data gathered on risk management in each country, allowed for an assessment of the status quo and for the identification of critical aspects to be taken into account when developing a tool to function as a support to DRR.
Evaluation of deliverable	The report revised the experiences of partners within MAppERS Consortium. The activity was excellent and was clearly devoted to digital and computing support systems adopted by smartphone solutions. The report highlights these aspects.
Value-added of deliverable	The overall conclusion from this study can be summarized as: despite the strong impact of the EU membership to the national civil security mechanisms these pilot countries Denmark, Estonia and Finland are still lacking interoperability and genuine sharing of capabilities. The administrative reforms are underway, but hindered by tendency to preserve the sovereignty at the cost of better interoperability. International disaster reduction within the intergovernmental relations lay basis for the foundation of the cooperation but it is too much stressed with multiple overlapping agreements and cooperation organs. Major finding was citizens and wider societal involvement in civil security. Commitment of society towards security vital functions of society. More effectiveness and efficiency are needed at the cost of preserving the sovereignty and sectoral thinking of the national civil security and crisis management systems. The use of voluntary organizations is higher in Nordic countries rather than Baltic countries and the usage of private resources is more common and accepted factor particularly in Denmark and somewhat in Estonia, which have the open tradition for public-private cooperation in civil security.
Dissemination	STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS ANALYSIS (SWOT) Links:

	- D2 - Report on Impact of Crisis in pilot countries: http://goo.gl/TuwO6i
Deviation from the DoW	The report listed a standard and complete dataset for gap comparative analysis. A SWOT final analysis could not be completed, due to: - Lack of common legislative, reliability of common of risk concept - Different roles of citizens due to internal activity of the partners - Lack of standardized procedures and scale of activity
Explanation	For SWOT analysis, two groups of information were collected for Estonia, Denmark, Italy and Finland. A first cluster listed internal organizations and responsibilities for each national civil protection systems. A second cluster amplified the analysis on risk management, issues of each rescue service, prevention strategies, participative decision-making, and technical aspects on DBMS. The parameters were unfavourable to achieve common objectives and consequently it was prudent not to eliminate requirements by single partner (formally not integrable), and proceed with a cascade effect within the methodology and the development. The approach of MP-APP was a customized framework, adaptable to different requirement and focused on modules MP-C and MP-V.

Task: **B** – **D**eliverable n. **4**: END USER WORKSHOP		HELLB
Description of deliverable	EAB was the primary instrument for ensuring high-quality and relevant support for the end-users. The EAB was formed by stakeholders e.g. local citizens groups, civil protection practitioners, as well as experts that can influence the formation of civil security policy. EAB members were invited by HELLB to project meetings as appropriate, to provide both inputs and feedback about progress of work. This deliverable aimed to facilitate the role of participating end users in a) defining end user requirements, b) securing professional end user testing and c) monitoring the impact of the projects results. The EAB activities were organized in EAB meetings and the EAB pilot testing of MP-APP. By participating with the MAppERS Consortium, the EAB members explained a wider understanding of how MAppERS results are used and will be used in many of the world's most demanding emergency response environments. The EAB was invited to participate to the videoconference meetings when operative collaboration steps and feedback mechanisms were defined. As such, the EAB is primary instrument for ensuring that project´s deliverables are high-quality and relevant for the end-users. The EAB took part to the first pilot testing with both modules MP-C and MP-V on 12 June 2015, Tallinn. Furthermore, EAB were constantly be invited to participate in project dissemination tasks, as they are best positioned to support outreach to other organizations/sectors of society.	
Purpose of deliverable	The EAB promoted (professional advice with final guidelines) the European civil protection mechanism and the Resilience Action Plan issued in June 2013 which provides the framework for continuing and scaling up EU efforts for resilience at different levels (from policy and advocacy to tools and methods) and with concrete country/region strategies and specific cases. The EAB also supported the enhancement of the national civil protection capacities under the EU Civil Protection Mechanism and its coordination by the Emergency Response Coordination Centre (ERCC). The implementation of the EAB Plan of Action supported "bottom up" resilience approach/strategies. This strategic approach was incorporated into all MAppERS documents and operational guidelines. The End User Workshops were organized as follows: 14-17 May 2014, Helsinki The aim of this end user workshop was to facilitate the Plan of Action for the End-User Advisory Board and to engage research activities (Task B) to meet the requirements and expectations of the multiple end-users. The meeting was held at HCRD and attended by	

	CNR, ISIG, HCRD, HELLB with Elisa Corporation, Airbus Defence and Space Corporation and the Finnish Meteorological Institute (FMI).
	12 June 2015, Tallinn The workshop was held back to back with the Sireen 2015 exercise in the municipality of Väike-Maarja, Estonia. The meeting focused on collecting information from multiple sectoral end users (police, rescue, border control) to the first pilot module of MP-APP. The meeting occurred in Tallinn as a wash up workshop among CNR, HELLB, HCRD, EASS and Airbus Defence and Space. The meeting was combined with the first Pilot testing of MP-V (Task E).
	2 October 2015, Barcelona The End User Workshops was technical and based on self-explanatory interface that guides (either volunteer or citizen) users through the questions. Feedback was received from the European Severe Storms Laboratory. It was further discussed about similarities between MAppERS and two ESSL projects.
	7-8 September 2015, Helsinki The agenda was to focus on the future of the MAppERS project and the role of hybrid networks where critical public safety networks are integrated with commercial or dedicated broadband services and asked how to integrate MAppERS to the TETRA and Tetrapol networks in Europe and how to assure its credibility, interoperability and easy usability. Airbus Defence and Space, Finnish Meteorological Institute, Elisa Corporation, GCSP, HCRD and HELLB attended the meeting.
Evaluation of deliverable	The EAB Plan of Action revised the experiences of partners within MAppERS Consortium. The experience was excellent and was clearly devoted to digital and computing support systems adopted by smartphone solutions. The above-mentioned workshops put together the leading experts and keynote speakers. By taking part and supporting these events, the EAB members enhanced their professionalism and increased their collaboration network.
Value-added of deliverable	The EAB included NGOs, corporations, public agencies known as leading experts in the field of crisis communications and early warning mechanisms. The aim was not to reach only comprehensive geographical and substantial coverage of the pan-European stakeholders but rather to pin point and encourage the best specialists in this field to take part to the MAppERS EAB. This EAB served also as a balanced platform of taking into account the views of both public agencies and private corporations.
Dissemination	Links: EAB Web page: http://goo.gl/GeB1Ec
Deviation from the DoW	No deviation
Explanation	n/a

Task: **B** − **M**ilestone n. **1**: DATABASE MANAGEMENT SYSTEM (DBMS) STATE-OF-THE-ART	CNR-ISIG
Description of milestone	The efficacy of the DBMS within specific contests and organization of emergency copes differently with local institutes, regional agencies and citizens. The report identified existing data management, horizontal database sharing systems, type and frequency of information. CNR compared existing integrated DBMS frame in pilot countries with FHFRS, HCRD and EASS.
Purpose of milestone	The security collected solutions on data access, frameworks of public database, the level of accounting and the data administration roles between partners.

Evaluation of milestone	Data flow charts are well listed within report. MAppERS partners are rescue services having evident roles and contributions within emergencies, and consequently a clear access right and update roles on local solutions of data transfering.
Value-added of milestone	Partners and end-users have a capacity of data transfer. The MP-APP development was customized and open by CNR for new local dataset. Furthermore specific tools within MP-APP open new data acquired by crowdsourcing with local datasets. The integration formally depends by participations of local authorities and database opening.
Dissemination	Links: - Report on DBMS: http://goo.gl/zWlpJi
Deviation from the DoW	No deviation
Explanation	n/a

Task C – Development of smartphone application

SA is the technical node of the project. MP-APP had two modules, MP-C for citizens and MP-V for volunteers. A Web dashboard offered a real-time and continuous data upload, linked by smartphone testing. The upgrade of MP-APP included both modules MP-C and MP-V. One report (55 pages) aggregates items to complete architecture of MP-APP, combined with upgrade and database infrastructure.

- D5 – Database application and GUI (Graphic User Interface)
- D9 – Software upgrade 1/3
- D9 – Software upgrade 2/3
- D9 – Software upgrade 3/3)
- D7 – Software application 2/3
- D7 – Software application 3/3

Task: **C** - Milestone n. **1**: STATE-OF-THE-ART OF MOBILE TECHNOLOGIES FOR DISASTER MANAGEMENT IN PILOT COUNTRIES	CNR
Description of milestone	CNR combined a first analysis on existing mobile technologies adopted in pilot countries for highlighted level of preparedness and technology. The analysis included research made by local rescue services (EASS/HCRD/FHFRS). SA for disaster management in pilot countries are not strongly available between citizens, but as common new supporting tool in volunteer's community. Emergency assistance technology appears profuse in Denmark with 8 SA available with Android/iOS systems.
Purpose of milestone	Create experience in communication technologies adopted by rescue service within pilot countries at national and local scale. Clarify presence of smartphone solutions adopted by safety or rescue services.
Evaluation of milestone	The report considered a clear trend in northern Europe to include technology in rescue services. The trend of data collections on fields is a common achievement including the evidence of smartphone presence within communities. The attendance within rescue services started as basic request without specific examples.
Value-added of milestone	Within pilot countries there is a specific technology feedback linked to user's requirement within emergency. A first response clarified usability and experiences to host an existing base line to next Report on Desk-Based Graphic Solutions and Smartphone Applications.
Dissemination	Links: - M7 - State-of-the-art of mobile technologies for disaster management in pilot countries: http://goo.gl/x20NU8

Deviation from the DoW	No deviation
Explanation	n/a

Task: **C** - Milestone n. **2**: DATA LOGGERS REVIEW		CNR
Description of milestone	CNR reviewed logger systems performed in pilot countries with HCRD and FHFRS, existing in technology within natural hazard and emergency management. The feasibility of data logger systems into the application can integrate MAppERS collected information by crowd contribution. Existing data loggers had to be considered as parallel providers, for typology of information, quality of data and owner authority.	
Purpose of milestone	Combining existing data loggers systems for natural hazards within pilot countries. MAppERS did not substitute existing solutions in pilot country, but required architecture and data type to avoid overlay.	
Evaluation of milestone	The report analysed data loggers at national levels. HCRD provided capacity of an internal web services (*Merlot OFFICE* and *BORIS*). The institute has a role of defence and security within pilot area supported by integrated database. FHFRS is a rescue service investing with crowdsourcing and long-term strategies, improves preparedness and efficacy solutions during crisis. Existing data loggers at national level, surveyed as data management technically were not directly integrated by MAppERS architecture for independence of frameworks.	
Value-added of milestone	Within MP-V a tool combined geo-location of users with real-time data providers. The API was positively tested and the report of development presents the extension (D7 – SOFTWARE APPLICATION 1/3).	
Dissemination	The report was an internal technical task, used within Task C – Development of SA. Links: - M10 – Data loggers review: http://goo.gl/oNSb8u	
Deviation from the DoW	No deviation	
Explanation	n/a	

Task: **C** - Milestone n. **3**: COMMUNICATION SCHEME		CNR
Description of milestone	Tools, contents and graphics are combined in specific MP-C and MP-V wireframes. The report (20 pages) combined existing smartphone solution analyzed for emergency response with communication parameters. Sequences of milestone: - M8 - STATE-OF-THE-ART OF APPICATIONS collected SA for natural hazards and management. The activity highlighted solutions on rescues services based on crowdsourcing solutions in several emergency contexts (Action C2 by CNR-ISIG) - M9 - SET OF GUIDELINES FOR ACTION C4 classified existing solution by communication, methods and graphic criteria (Action B4 by ISIG-CNR) - M11 - COMMUNICATION SCHEME provided by previous milestones the architecture for the communication scheme of MP-APP	
Purpose of milestone	To prepare a high-level structural, skeleton and surface plan of MP-APP combining solutions for emergency response with basic communication criteria.	
Evaluation of milestone	The Action was fundamental to classify usability and content of other solutions at world level. Some apps collected and tested provide efficient examples but with un-complete	

	communication parameters. Other solutions with efficient parameters like layout, navigation and icons parameters do not cover a clear aim.
Value-added of milestone	MP-APP followed both criteria of communication scheme and emergency support. The step offered a state-of-art of further development, based on integration of improvement and communication.
Dissemination	Links: - M11 - COMMUNICATION SCHEME: http://goo.gl/M5sL1M
Deviation from the DoW	No deviation
Explanation	n/a

Task: **C** - Deliverable n. **1** SOFTWARE APPLICATION	CNR

Description of deliverable	The report (22 pages) illustrates engineering and development for MP-APP made by CNR. The architecture portrays specific technical steps for MP-APP:
	- MP-APP PROJECT PLAN: environments for three profiles. MP-C with access allowed to citizens, MP-V with access allowed to volunteers and Admin with access to both modules. Items and parameters produced, listed hereafter:
	  - *Web Application* (WA): Accessibility with login prompt. Functions of data query, exporting collected data and visualization of geo-localized results. Cloud based service hosted on provider with web based APIs allowing migration of the service if needed.
	  - *Mobile App Android* (MA): Push notification and data gathering when the network is available for registered end-users. Compatible with *Android 4.1* and higher, sending geo-locate data (numbers, text, photos, videos) towards app interfaces.
	- MP-APP PROJECT STEPS: Iterations of development completed with a test session on smartphone. The step is testing compatibility, providing regularly checks on scientific quality and technical bugs.
	  - *Web Services, Database* and *MA in Demo:* Data base structure created to support the web solution and the mobile app. In *Demo* version the basic web services are implemented in the MA. The principal functions were updated after piloting activity.
	  - *Finishing iteration and development:* regular software releases after every update of MP-APP, combined with timely feedback by users after iteration. WA and MA here completed.
	  - *PIR (Post Implementation Review)*: evaluate project success and degree of divergence from starting steps by indicators of performance, final post implementation review and correction based on feedback after piloting (bug-fixing or improvement in MP-APP).

Purpose of deliverable	To prepare architecture of MP-V, MP-C and dashboard. Content and structure designed with rescue services of project. Using piloting as key-point to adapt bug-fixing, testing slides and update contents.
Evaluation of deliverable	The Android SDK enabled the creation of SA for the Android platform. It includes source code, development tools, required libraries and emulator. MP-APP was developed and synchronized with testing. There existed a mutual interaction between partners and CNR aimed at the continuous App improvement.
Value-added of deliverable	SOFTWARE APPLICATION 1/3 is linked TO SOFTWARE APPLICATION 2/3 and SOFTWARE APPLICATION 3/3. Second and third deliverables defined optimization of MP-C and MP-V based on TASK E – Pilot testing.

Dissemination	D7 – SOFTWARE APPLICATION 1/3, linked to D7 – SOFTWARE APPLICATION 2/3 and D7 –SOFTWARE APPLICATION 3/3 after optimization. Applications has three components within the same deliverables with two levels after pilot testing. Links: - D7 – SOFTWARE APPLICATION 1/3: http://goo.gl/MwLZtM - Environment extended version: http://goo.gl/oNj52v - Wireframe extended version: http://goo.gl/c5E59N
Deviation from the DoW	Android prevalence for MP-C and MP-V to optimize time for development, publishing, testing and upgrade
Explanation	Development with Android allows for further customizations and adaptations of the app. Using Android it is easier to install changes and updates to the app including testers' insights continuous. Time line set within GANTT is maintained with Android development.

Task: **C** - **D**eliverable n. **2** SOFTWARE UPGRADE		CNR
Description of deliverable	The first upgrade of MP-C and MP-V was on methodology, simplicity graphic rules, usability and interfaces. CNR improved an access on dashboard with same SA profile. All partners in MAppERS Consortium have access as *Admin* profiles. Furthermore the activity of dashboard was included in piloting testing for bug-fixing and rescue service requirements.	
Purpose of deliverable	Bug-fixing and failures have been collected, both on dashboard and on SA. Testing and simulations gathered malfunctions on architecture and each single tool.	
Evaluation of deliverable	After piloting (Task E – Pilot Testing) dashboard was update after crowdsourcing feedback. Efficiency was improved only after piloting action.	
Value-added of deliverable	Dashboard setting completed MP-APP architecture for MP-V and MP-C. Data had an easy-to-use interface. Testing activity of users on field is real-time. Processing and exporting information is customizable.	
Dissemination	Links: - Software upgrade 1/3: http://goo.gl/uFM8Zi - Dashboard: http://goo.gl/lqtbzd	
Deviation from the DoW	No deviation	
Explanation	n/a	

Task D – Creation of pilot groups

This task has set the basis for the implementation of the piloting in each end-user partner country.

Task: **D** – **D**eliverable n. **1**: IDENTIFICATION OF RELEVANT AREAS FOR PILOTING		ISIG
Description of deliverable	The pilot proceeded from a consortium brainstorming (conducted by ISIG in Padua at kick off meeting, on 4 March 2014) and developed through in-depth interviews with representatives of HCRD and FHFRS and in collaboration with EAB. Carried out by ISIG researchers and CNR, the interviews aimed at identifying the outreach possibilities of each operative partner, in terms of volunteers and citizens, and the potential domain of testing they could provide. The interview-based data gathering was followed by a more specific definition of roles, competences and piloting dates during the mid-term meeting held in Gorizia on 8 April 2015 and conducted by ISIG. During this meeting also insights from EASS were gathered on their outreach potential for piloting, to be held during a Rescue Service International Exercise.	
Purpose of deliverable	The purpose of this actions was to define clearly the areas, context and potential outreach of partners in order to organize pilot testing of the two modules.	

Evaluation of deliverable	The process was successful and allowed for participatory decision making within the consortium.
Value-added of deliverable	The methodology used for the joint definition of pilot areas and implementation strategies could be effectively replicated in other contexts.
Dissemination	n/a (the deliverable related to this action is D.F.1 Report on Pilot testing). Preparatory materials: Links: - Interview HCRD: http://goo.gl/D5OyQU - - Interview FHFRS: http://goo.gl/8kpUA8 - Mid Term meeting report: http://goo.gl/2klU1i
Deviation from the DoW	No deviation
Explanation	n/a

Task: **D** – **D**eliverable n. **2**: INFORMED PILOT GROUPS		ISIG
Description of deliverable	EASS, HCRD and FHFRS contacted their volunteers, students and involved citizens in the activities organized for the testing of the two modules. Feedback forms were prepared by ISIG for both MP-C and MP-V. The feedback forms are composed by a screenshot of each of the app screens, and a feedback box where guiding questions have been inserted for testers to give their insights. The feedback forms were distributed to partners as standard data gathering template. In order to ensure data protection and informed participation of testers to the piloting, dedicated consent forms have been prepared by ISIG to be distributed to all partners. During Mid- term meeting in Gorizia, partners have been introduced to the functions and use of consent forms and trained on how to inform testers. All testers, either citizens or volunteers, have received detailed information on the scope of the testing and on the use of their data (for research purposes) and their storage. All testers signed an informed consent form (template attached as Annex II to this document), that is stored at partners premises. EASS, HCRD and FHFRS, supported by the material provided and following preparation done during Action D.1, organized dedicated meetings/workshops with citizens and volunteers for the presentation of the App prior to their involvement in the testing.	
Purpose of deliverable	To guarantee informed participation of citizens volunteers, while ensuring data protection within the testing and data elaboration processes.	
Evaluation of deliverable	The activity was successfully implemented and is reported in details in the deliverable of task E (piloting).	
Value-added of deliverable	The implementation of such a protocol ensures the possibility to undertake testing activity while also protecting citizens' right to privacy and to transparency of information.	
Dissemination	n/a (the deliverable related to this action is D.F.1 Report on Pilot testing). Links: - Interview HCRD: http://goo.gl/D5OyQU - Interview FHFRS: http://goo.gl/8kpUA8 - M.D.2 – Feedback forms for collection of testing feedbacks: from users http://goo.gl/663qKr	
Deviation from the DoW	Meeting with stakeholders/users were directly conducted by partners at local level (Denmark, Finland, Estonia), following ISIG's framework. The main goal of the task thus became the development of materials and protocols so to ensure informed participation of citizens/volunteers and data protection.	

Explanation	Having ISIG coordinating the action and elaboration of materials was important, but the dialogue with stakeholders at local level has been deemed as preferably performed by the rescue services involved in the project, so to avoid language barriers and facilitate communication.

Task E – Pilot Testing

This task allowed the testing of the prototype App in different context/countries. One report (55 pages) aggregates items to complete architecture of MP-APP, combined with upgrade and database infrastructure.

Task: **E** – **D**eliverable n. **1**: Pilot testing of MAppERS-C prototype		ISIG-CNR
Description of deliverable	Denmark : The piloting in Denmark planned with FHFRS in Frederikssund municipality was conducted in collaboration with the local Registry Office, that shared the official address geodatabase for MP-APP testing. The piloting was prepared on 29 September and occurred on 30 September. The first activity implemented was a training activity on MP-C for citizens, organised by FHFRS in collaboration with CNR. Then testing of the MP-APP was implemented both for trained and not-trained citizens, so to allow for a comparison in terms of usability and intuitiveness of the app. In order to prepare this testing activity, a translation in Danish of the MP-APP was developed. The feedbacks presented by testers included bug-fixing issues and general insight on usability and content of the MP-APP. The activity involved 12 citizens and local FHFRS members aged between 18 and 65 years. The younger testers revised mainly on technological aspects, malfunctions on dashboards and flowcharts. The older members of the testing team provided feedback on methodology, sequences of work and usability of single tools.	
Purpose of deliverable	Output of piloting of MP-C by citizens was bug-fixing, usability and awareness for long-term preparedness and data gathering, in case of flooding emergency. Testing divided in trained and not-trained teams to check MP-C usability and performance compared with level of preparedness. Control on bug-fixing, methodology, functionalities and data collections were checked.	
Evaluation of deliverable	Tested was positive for MP-C. Brilliant approach by trained and not-trained teams. Danish translation improved a direct comparison of MP-C between local rescue service with inhabitants about preparedness and support in case of events.	
Value-added of deliverable	MP-C was built for a direct involvement of users. CNR obtained several feedbacks standardized with pre-compiled reports. Not only bug-fixing and controls but suggestions and opinions enlarged aims of MP-C.	
Dissemination	Link: - Summary report on MAppERS-C testing activities: http://goo.gl/yPknI4 - Feedback forms for users' testers: http://goo.gl/663qKr	
Deviation from the DoW	No deviation	
Explanation	n/a	

Task: **E** – **D**eliverable n. **2**: Pilot testing of MAppERS-V prototype		ISIG-CNR
Description of deliverable	Finland : The piloting exercise in Helsinki was created together with Tammisalo Voluntary Fire Brigade (TVFB), which is one of the supporting contractual units in the City of Helsinki. Four members of the TVFB agreed to work as the actual testers during the agreed time.	

	The scenario for the testing was a storm situation where 112-center (emergency control room) could (would) be overstretched and the prioritizing of the queued alerts / operations would be needed. In order to obtain relevant information from the affected areas, HCRD decided to mobilize voluntary fire brigades. The MP-V tool was to be used as the reporting tool / line to the HCRD operations centre. On 25 August 2015, HCRD introduced the project to TVFB personnel on the idea of the MP-V software and its use. At the same time, HCRD provided TVFB with the smartphones acquired by the project (distributed by CNR to partners during the Mid-term meeting in Gorizia in April 2015). The phones remained at the use of the TVFB as their property, also after the piloting was finalized. The piloting took place on 1 September and was combined to TVFB's weekly training exercise. Four individual pilot testers did observations within the operational (geographical) area agreed while planning for the piloting. The time during which the testing took place was between 18:00 hrs and 21:00 hrs. The timing was agreed beforehand, according to TVFB's normal training schedule. Estonia: Rescue School in Väike-Maarja yearly conducts practical exercises for graduating courses. In 2015 it took place on 11 June, implying the testing of MP-C and MP-V. It involved more than 90 students of EASS and rescue schools from Finland, Poland, Germany, Latvia and Lithuania. Rescue services, police and ambulance services were involved in the exercises and medical field hospital was set up. Road accidents, chemical spills, collapsed buildings, fires and other incidents were simulated on the training ground. Both MP-C and MP-V were tested in relation to their potential as a training tool for students who are in the process of becoming Civil Protection professionals. The purpose of the test was to check whether the app could be a reliable tool in addressing the attention for students towards certain specific elements of risk/danger and identify the main data to be reported in an emergency situation.
Purpose of deliverable	Output of piloting of MP-V by volunteers was bug-fixing, usability and awareness for data gathering, in case of emergency within the city of Helsinky. Testing simulated volunteers on field, collecting several data for open source dropdown menu. Each squad had free-edit access with capacity to collect information and propose new text in real-time. Geo-located position of volunteers were tested, classified by specific parameters and compared by rescue service.
Evaluation of deliverable	Database and workflow on background of MP-V was vast and previously prepared by CNR with HCRD. Testing was integrated within rescue teams, organized by 5 professionals for single squad.
Value-added of deliverable	The efficacy of open data access involved a direct control to volunteers on-field, enlarging management on squads by rescue services. Feedback of piloting revealed evident advantage of real-time classification and geo-location of single members. Checking activity on field is integrated with data gathering by single member. Data analysis on dashboard was excellent and profitable as data gathering and future integration for HCRD capacity.
Dissemination	Link: - Summary report on MP-V testing activities: http://goo.gl/yPknI4 - Feedback forms for users' testers: http://goo.gl/663qKr
Deviation from the DoW	No deviation
Explanation	n/a

Task: **E** – **D**eliverable n. **3**: PILOT OUTCOMES	ISIG

Description of deliverable	This report summarizes the outcome of piloting activities in Estonia, Denmark and Finland.
Purpose of deliverable	The purpose of this report is the collection of all insights so to have them available for MP-APP revision.
Evaluation of deliverable	The report fulfilled its purpose.
Value-added of deliverable	n/a (report).
Dissemination	Online on project website partner area and disseminated to all project partners for review before publication. - D.E.1 Piloting report: http://goo.gl/yPknI4 - Video of Sireen piloting exercise (Estonia): https://goo.gl/HNNYIv - M.D.2 – Feedback forms for collection of testing feedbacks from users: http://goo.gl/663qKr
Deviation from the DoW	No deviation
Explanation	n/a

Task: E – Deliverable n. 4: SOFTWARE UPDATE (MP-C and MP-V)		CNR
Description of deliverable	Optimization of MP-C and MP-V made by CNR was the aim of Action E.2, linked to bug fixing and enhancement within modules. The action includes upgrades to MP-C after piloting performed by FHFRS and upgrades of MP-V after piloting performed by HCRD. Piloting results and criteria listed by ISIG in Action E.1 included details of the experiences and tools adopted.	
Purpose of deliverable	The experience with FHFRS for MP-C offers evaluations of usability, simplicity of tools and simulation on emergency crisis with local citizens. Testing provided completion of guidelines in Danish language, bug-fixing examples, buttons review of single slides. Testing with HCRD for MP-V provided simulation on volunteers about squad on-field. Testing collected open new text for single flowchart, furthermore evaluated and introduced within menu. Geo-location was corrected for bug-fixing with several volunteers on field. Adding tools included emergency messages and network of communication for different end-users. Dashboard was updated for DBMS, especially for data list and real-time synchronization with activity by modules. Admin can finally access to control simultaneously MP-C and MP-V.	
Evaluation of deliverable	The activity was an efficient outcome exploiting feedback after piloting. Testing with training and not training groups, the upgrade included dashboard optimizations about type of messages, efficacy of tools, data access and level charts. Efficacy of piloting provided a useful database on usability, saved as listed reporting and guideline by users.	
Value-added of deliverable	Action E.2 is linked with Action E.4 as mutual components of upgrade of MP-APP and dashboard after piloting. The upgrade completed efficiently dashboard, modules, data transferring and collecting.	
Dissemination	Links: - D7 – Software application 2/3: http://goo.gl/uFM8Zi - D9 – Software upgrade 2/3: http://goo.gl/uFM8Zi - D7 – Software application 3/3: http://goo.gl/uFM8Zi - D9 – Software upgrade 3/3: http://goo.gl/uFM8Zi	
Deviation from the DoW	No deviation	
Explanation	n/a	

Task: **E** – **D**eliverable n. **5**: Database application and GUI (Graphic Use Interface) 3/3		CNR
Description of deliverable	To develop a worthwhile SA for citizens and volunteers, best practices on DBMS, design of information sharing and communication tools. MP-C and MP-V required a GUI based on experiences made in Action B4 and update to the first prototype offered to piloting.	
Purpose of deliverable	Criteria of usability, layout, navigation, color, text and icons had to follow on existing solutions at European level. The optimization for graphics depended on piloting and testing feedback. The GUI upgrade provided dashboard optimization based on activities for users, graphical layouts, data storage and final utility.	
Evaluation of deliverable	GUI update was linked to the efficient research made in Action B4. Piloting demonstrated efficiency of communication system adopted in both modules and in dashboard offering same graphic criteria for each end user.	
Value-added of deliverable	Clarity of graphics strongly posed with starting development, improving efficacy of both modules since first draft. The dashboard was completely synchronized with modules after piloting, including graph criteria.	
Dissemination	Link: - MApp OPTIMIZATION-UPGRADE-GUI: http://goo.gl/uFM8Zi	
Deviation from the DoW	No deviation	
Explanation	n/a	

Task F – Production of training curricula

This task has developed video tutorials for the use of MP-APP and a booklet accompanying the videos, as means of training curricula and materials. These tools can be downloaded from project website and guide both volunteers and citizens in the full exploitation of the MP-APP potentiality. The use of online video tutorials as means of training materials has been discussed with partners and especially with EASS, which has tested the tool with its Civil Protection Academy students and has deemed these tools more 'catchy' and useful. In addition, this strategy makes the training less dependent on professional trainers that can in this case act as a support, but are not the only sources of knowledge. This on one side reduces the cost of training and, on the other makes territorial mapping awareness open to a wider public. In addition, having video tutorials available online allows for further feedback from users/wider public. This in turn is an added value for the further upgrade of MP-APP.

Action F.1 (Identification of objectives of training) and F.2 (Identification of trainers and coaches) were undertaken by ISIG in collaboration with CNR, FHFRS, HCRD and EASS prior to, during and after pilot testing.

These preliminary actions (workshops, skype call interviews) were aimed at identifying the main topic of interest in terms of training that MAppeRS could provide. This resulted to be the MP-APP itself, both as a tool for volunteers of reporting of geo-localised, precise data to headquarters/control rooms (in HCRD experience), and as means of raising awareness among the citizens about their possibility to actively contributing to territorial mapping and risk management (in FHFRS experience). Also, as EASS experience suggested, the testing of the app itself could be a relevant topic of training for professional civil protection/rescue service staff.

Task: **F** – **D**eliverable n. **1**: TRAINING CURRICULA AND TRANSLATION		ISIG
Description of deliverable	Following the results of actions F.1 and F. 2 (F.1 – Objectives of training; F.2 – Trainers and coaches), the training curricula and materials were focused on the use of MP-APP. Video tutorials of MP-C and MP-V were produced by ISIG and uploaded on the project website. Also modules Users' Guidelines have been prepared and made available on website as means of downloadable guide.	

Purpose of deliverable	Providing basic training on the use and potential of MP-APP.
Evaluation of deliverable	These tools have been tested with end users partners as well as presented to local civil protection units in Italy (Regional Civil protection Department in Friuli Venezia Giulia, Municipal CP units of Lignano Sabbiadoro, Gorizia, Sagrado, Staranzano during and prior to Final event of ECOSTRESS project, to whom MAppERS team leader participated and illustrated video tutorials). They have been evaluated as very useful training tools, to be inserted in civil protection training modules. The testing of the tool in itself has been deemed by Civil Protection professionals as a relevant training activity for volunteers or for students that participate to risk awareness campaigns. MP-APP so far is only available in English and Danish. Further translations can be made available on request, but so far EASS and HCRD deemed the English version as relevant for their target areas.
Value-added of deliverable	The value added for MAppERS is the potential of the videos to reach a wider audience, besides operators/professionals, and to act as awareness-raising tool on civil protection topics. The transferability of these video-tutorials methodology is vast, as the best way to guide the user through the different functions of an app is a visual tour (following the large diffusion of knowledge/skills by means of video – tutorials such as those available on You Tube). The interest towards the modules and their video tutorials has already been expressed by the Regional Civil protection of Friuli Venezia Giulia. The CP regional headquarters would like to disseminate MP-APP and the training material to volunteers, prior to the national civil protection exercise that will be held in 2016 (as a commemoration of the 1976 earthquake that represented the first event under which the actual CP system was established). Also, they expressed their interest in the testing the MP-APP during the exercise.
Dissemination	Online on project website. - D.F.1 Training materials Video Tutorial MAppERS- C: https://goo.gl/ECBH4K - D.F.2 Training materials MAppERS – C User's Guidelines: http://goo.gl/RBlTiX - D.F.3 Training materials Video Tutorial MAppERS –V: https://goo.gl/emdSPe - D.F.4 Training materials MAppERS –V User's Guidelines: http://goo.gl/QuY2oW
Deviation from the DoW	The main focus of training materials has been the use of the MP-APP itself, rather than theoretical lessons on DRR.
Explanation	Rescue Services and Civil protections contacted throughout the project have expressed a specific interest in this rather than more theoretical topics to be delivered to their volunteers. Also citizens involved in the testing expressed a specific interest in getting to know further the MP-APP potentials.

Task: **F** – **D**eliverable n. **2**: SELF - EVALUATION		ISIG
Description of deliverable	Self evaluation checklist is a set of questions for citizens approaching MAppERS-C tutorial and guidelines.	
Purpose of deliverable	The purpose of the checklist is to support the citizen approaching MP-APP to evaluate his/her level of preparedness and knowledge about self-protecting behaviors to be adopted in preparation for and while coping with flood risk and recovery. This questionnaire is to be filled by the user before visualizing the video tutorial and the dedicated Users' Guidelines. By answering the questions the attention of the user is raised towards main issues to be taken into account when preparing for a hazardous event and dealing with an emergency. This additional tool is aimed at raising awareness in the user about self-protecting behaviors, by stimulating his/her own attention to	

	certain details, and then forwarding to the tutorial and the MP-APP itself for further in-depth information.
Evaluation of deliverable	This tool is deemed as very relevant for self-responsibilisation and awareness raising purposes. The testing of the App has shown so far the effectiveness of such a methodology to increase the efficacy of the App impact on the aforementioned aspects. The impact on users' approaching MP-C will be evaluated in the future and will be based on users' feedbacks (via MAppERS socials).
Value-added of deliverable	This approach, based on self –empowerment of citizens and deductive self-awareness methodology is very relevant when the didactic purposes of smartphone technology are at stake. Thus, this tool, as a complementary asset of video tutorials and guidelines represents a value added in terms of user-friendliness approach and in facilitating the diffusion of the App among the wider public.
Dissemination	Online on project website. Link: - D.F.5 Citizens self-evaluation checklist report: http://goo.gl/uobiM5 - D.F.6 User's checklist: http://goo.gl/gmzqHB
Deviation from the DoW	No deviation
Explanation	n/a

Task G – Policy recommendation

This task has produced a policy recommendation guideline, based on MAppERS insights, in the light of relevant international and EU frameworks.

Task: **G – D**eliverable n. **1**: POLICY RECOMMENDATION GUIDE		ISIG
Description of deliverable	This report summarizes project insights vis-à-vis Sendai Framework and relevant corresponding EU frameworks. The main topics identified relate to: - Stakeholders involvement in Disaster Risk Reduction (DRR); - Use of smartphone technologies and crowdsourcing as means of empowerment of civil society; - Raining of citizens and volunteers as key of awareness raising policies and self-responsibilisation; - Multidimensional approach in tackling risk management. The data gathering for this report proceeded from: - Literature review on relevant international and EU frameworks; - Summary of project insights/lessons learnt; - Workshops with stakeholders and project partners during MAppERS final event (26.11.2015) to gather their insights and feedbacks on project results and potential future developments.	
Purpose of deliverable	Providing local and EU institutions with useful insights when dealing with new methodologies and tools for DRR, drawing from both international and EU frameworks and MAppERS project's insights.	
Evaluation of deliverable	The report draws from insights gathered during project life time and dissemination of its results. The Italian National Civil Protection department for volunteers engagement expressed its interest in the results achieved by the project and in the potential that such a tool as means on further involvement of citizens in the territorial monitoring. Also, by stressing the importance of MAppERS impact, the importance of stimulating self-protecting behavior among the population was deemed as key by local authorities. Thus, since the report stems from punctual feedbacks from relevant operators as well as local authorities, its relevance is deemed to keep.	
Value-added of deliverable	This is meant as a pan-European tool and as a basis for future EU project and strategies development.	

Dissemination	Online on partner area on project website.
	- D.G.1 Policy Recommendation Report: http://goo.gl/XIl7KB
Deviation from the DoW	No deviation
Explanation	n/a

Task H – Publicity

This task aimed at ensuring coordination in dissemination, internal and external communication, as well as of exploitation activities.

Task: **H – D**eliverable n. **1**: COMMUNICATION/DISSEMINATION STRATEGY		ISIG
Description of deliverable	The Communication strategy was drafted within one month from the official start of the project. It contains guidelines for dissemination (according to visibility riles set forth by the EC), and templates for internal and external communication (within and outside the consortium), namely the files of: PowerPoint presentations, reports, project team and EAB members business cards, MAppERS brochures posters and roll-ups. All materials were produced as annexes to the report and made available to all partners in the project partner area. It also identifies target groups for different dissemination events and a timeline of potential public events to be realized within the project lifetime. Also, it contains guidelines on the projects' online platforms (website, socials) and tools (Dropbox). Following the consortium willingness to exploit project results further and identify strategies for an effective follow-up of MAppERS activities, ISIG has created a new section in the MAppERS Communication Strategy dedicated to exploitation (20 pages). The updated report is available on project website and capitalizes on all the information gathered during project proposal, partner and extended network insights on exploitation potentials.	
Purpose of deliverable	The purpose of the strategy is the creation of a coordinated action among all consortium members, when communicating internally, and when disseminating the project externally. The Communication strategy guarantees a coordinated graphic identity to all materials, within EC visibility rules and so to guarantee transparency of information for all stakeholders and actors interested to access public information about the project. Also, its exploitation section aims at summarizing and systematizing all exploitation ideas/initiatives explored, so not to lose track of them and have a pathway towards their implementation. They include both strategic planning (as means of bringing MP-APP at the attention of CP operators and local authorities, to keep testing the tool) and further project development plans (such as possibility of capitalizing results of ECOSTRESS with those of other EU projects and initiatives).	
Evaluation of deliverable	The Communication strategy guaranteed a good visibility to the project activities, results and allowed for a coordinated communication among partners. Thus, it was successful in achieving its goals. Even though exploitation results are not yet visible, the exploitation plan report has been so far a successful 'inbox' for all consortium and EAB insights.	
Value-added of deliverable	An effective communication strategy and the transparency of information ensures a good visibility of the project activities and events and allows all interested to participate. This is particularly relevant in a project like MAppERS, that was based on the importunate of CSOs and stakeholders participation.	
Dissemination	The strategy was disseminated to all partners as a guideline to their communication action. Templates (brochures, posters etc.) were made available to partners to use for	

	all their public dissemination/information events. The exploitation section has been shared among all project partners for review and integrations. For dissemination purposes, a dedicated video-teaser has been produced and posted on website ('Training materials' page). - D.H.1 Communication Strategy: http://goo.gl/Nl0XUs - D.H.1.1 Communication, Dissemination & Exploitation report: http://goo.gl/27G1fa - D. H.1.2 MAppERS presentation video: https://goo.gl/hVgzK2
Deviation from the DoW	Exploitation plan added as further section to the strategy.
Explanation	The newly introduced exploitation section aims at summarizing and systematizing all exploitation ideas/initiatives explored, so not to lose track of them and have a pathway towards their implementation.

Task: **H – D**eliverable n. **2**: CREATION/UPDATE OF PROJECT WEBSITE		ISIG
Description of deliverable	The website www.mappers.eu has been created one month into the project lifetime. In addition, from what was foreseen at project's beginning, also a Facebook (Mappers) and Twitter (@MAppersEu) dedicated accounts were created and integrated one into the other in order to ensure greater visibility. A Linked-In MAppERS group has also been created including all researchers and partners, as well as members of End Users Advisory board.	
Purpose of deliverable	The purpose of the project website as well as of social network project pages (Twitter and Facebook) is to guarantee visibility, internal communication and dissemination from the very beginning of activities.	
Evaluation of deliverable	The outreach of the online communication strategy proved to be effective, the dissemination of events was particularly successful. The website was also deemed as a very useful tool for sharing internal materials among the consortium and keep track of deadlines and upcoming events. The website has a dedicated partner area where partners can access to all relevant documents (via dedicated Dropbox folder). The survey conducted on several projects (within task B) to gather state-of-the-art on prevention and MP-APP implementation had highlighted a less-than-effective dissemination activity featured by some of the projects. Finding official documentation/information about the projects was difficult: some materials were not available online although having been produced; some official websites did not clearly display tasks/deliverables/partner involved; information on events was not updated. From this experience, the effort to make MAppERS online tools as transparent as possible has been daily and the outcome is satisfactory, both from the consortium's perspective and from external visitors/stakeholders that could retrieve info on results and events on the project's website and socials. Feed of news from socials are redirected to website and viceversa. (Socials' statistics: Twitter: 81 tweets, 18 followers among operators; Facebook: 134 likes on events/initiatives).	
Value-added of deliverable	An effective communication strategy is key for transparency of project results, communication and coordination among partners, dissemination strategy (especially so in a project based on crowdsourcing and information sharing). The website and online tools of MAppERS have represented a value added in terms of network creation and publicity of vents and initiatives promoted.	
Dissemination	Link: - Project website: www.mappers.eu - Facebook: https://goo.gl/CuvkWH - Twitter https://goo.gl/rBgmxU - Linkedin https://www.linkedin.com/groups/7474410	

Deviation from the DoW	No deviation
Explanation	n/a

7. Evaluation of the technical results and deliverables

Design and testing MP-C and MP-V coped with Android SDK. Due to technological utility and time-line of the project, HTML5 was not adopted to development since a not complete usability for required tools. Android and iOS are professional kits covering most of all IT market. Android SDK offered direct customization, and sharing wireframes with testers. MAppERS runs code in the background of on Android SDK, while iOS is different for architecture. Android appeared with quick and direct profits of customization (tools, graphics, processors), hereafter more adapted with aims of project and piloting key points (development, testing, update). Smartphone computing is a complex framework, but MAppERS pointed to simplicity and usability for end-users behind development. The research on external experience offered several examples, including not positive skills and advantages of specific technologies.

Creating "light DBMS" integrated with public agencies appeared tricky, because of limited open source of public platforms and database. Review of DBMS on-course in pilot countries suggested brilliant contents but not direct accessible (e.g., weather forecast map). Hereafter MAppERS performed scalable modules, based on innovative technology and complete for project aims. The customization in the SDK compiled open integrations with external framework (e.g., citizen location overlapped external meteorological geospatial layers). Overlay with public data layers is important especially for rescue services. MAppERS included tools for future integration. Permission for data access with public authority was not compatible with project time line. Link with public institutes is vital, but overlaying local roles.

The power of crowdsourcing appeared as profitable advantage on data validation and gathering. Standardization of slides, toolbox and training posed an efficient instrument for end-users, synchronized with dashboard and simulation of rescue services. Importance of piloting appeared fundamental for testing and the direct roles within local communities. Piloting appeared as the clear key-point after development, within similarity and distinctions within EC partners. The role of testers started with aims of bug-fixing and technology feedback. MAppERS offered efficient experiences where stakeholders engaged brilliant participations. The piloting amplified a base requirements technology capabilities with parameters of user-friendliness, accessibility and perceptiveness of the solution developed.

Bug-fixing, usability and data flow evaluated the technological efficacy, and the role of local citizens transformed their "experience" to precious data loggers and testers. Volunteers had experience on field surveys based on their jobs. Piloting occurred within rescue squads, as official integration to their official roles, improving strength of MAppERS efficiency. Within a clear scheme of volunteers action MAppERS offered a possible challenge for rescue service. The criteria to avoid overlapping with efficiency and organization of rescue service improved visibility of MP-APP, designing tools for further action (real-time distribution and classification of volunteers on field).

8. Follow-up

As a result of debates among the consortium partners, as well as of feedbacks analysis concerning the piloting tests, the following future potential for the MAppERS App have been identified:

8.1. Crowd-sourcing in risk prevention tool

The MP-APP has shown the potential of crowdsourcing technologies as means of engaging citizens as:

- It allows citizens to directly report exposed elements, and thus, giving to the local community a primary role in risk prevention measures/strategies;

- It serves also as an educational tool, giving to citizens information on risk response.

Moreover, the MP-APP enriches:

- Volunteers – with an operational tool, allowing them to contribute with structured information to the work of specialized services (e.g., Civil Protection);
- The Civil Protection – with further reliable data form trained sources (volunteers).

In general, the tool has a great potential for raising awareness among citizens on the possibilities to actively contribute to the management of the territory they inhabit, that is, on the possibilities of active citizenship.

In fact, in the second trimester of 2016, it is foreseen that MAppERS App and overall outputs will be presented and used during the implementation phase of a project, which aims to promote active citizenship, "Bluewin" – co-funded by the EACEA Europe for Citizens Programme, under the Measure 2.1. Town Twinning.

The "Bluewin" project aims to put the basis of an EU network of active citizens (i.e. the blue-sentinels volunteers) by means of intensive training sessions during one week in Zadar (HR), on issues related to environmental and natural risk. The trainees, 280 high-school and university students from 5 EU Countries (i.e. IT, SLO, HR, MNE, UK), will be introduced to the MP-APP, and, together with MAppERS experts, will test the potential of the MP-APP for the reporting of areas in immediate need of natural protection.

8.2 Training tool

As demonstrated also in the Estonian Piloting Test, the MP-APP has a great potential for what concerns training tools for students/trainees/professionals which undertake a Civil Protection/Rescue services preparation course.

In fact, the MP-APP was used with success by 90 students of The Estonian Academy of Security Sciences and rescue schools from other 4 countries (i.e. Finland, Poland, Latvia and Lithuania). In this particular case, the MP-APP was used for preparing/ triggering the students' attention on the hot-spots of risk, and thus facilitating the identification of the elements that should be reported, in different disaster/risk/danger scenarios (i.e. chemical spills, collapsed structures, fires, etc).

Moreover, the potential of the MP-APP for being deployed in training sessions is also enhanced by the availability of video-tutorials (i.e. MAppERS – V: Tutorial for Volunteers and MAppERS – C: Tutorial for Citizens – available on the MAppERS website – www.mappers.isig.it/media/video/). The piloting sessions and dissemination activities have gathered very positive feedbacks on the tutorials, both from expert audiences (i.e. volunteers, Civil Protection representatives, rescue officers) and from the general public (i.e. citizens, students). The videos will be further deployed and promoted by all consortium partners in future activities of exploitation and dissemination.

8.3 Drill tool

The MP-APP has the potential for an institutionalized use at national and EU level, as a tool for Civil Protection/Rescue services and organisms in Drills/Exercises related to Disasters/Emergencies (e.g., earthquake drills, fire drills, etc).

In fact, the MAppERS Consortium is engaging in promotion activities that aim to present and deploy the MP-APP, during an important earthquake drill, which will be organized by the Regional Civil Protection in 2016, in the Friuli Venezia Giulia Region (Italy). The earthquake rescue drill will be organized during the First National Italian Civil Protection Assemble, which will also mark the commemoration of one of the major natural disasters in Italian history – the 1976 Friuli Venezia Giulia earthquake, that severely hit the mountainous area causing the death of approximately 1000 persons. The post-earthquake crisis management efforts, among others, led to the establishment of the Italian Civil Protection Body, which now deals with emergencies prevention and management at national level.

The Consortium has set the basis for the involvement of the MAppERS project and MP-APP during the above drill, within 2 meetings:

- Palmanova, (Friuli Venezia Giulia Region, It)- 10.02.2015 - CNR representatives meeting with the Regional Civil Protection– debates around the possibility of MP-APP deployment in activities of Civil Protection –FVG;
- Gorizia, (It) – 11.12. 2015 – ECOSTRESS Project Final Conference – both CNR representatives and the Regional Civil Protection –FVG were present at the the Conference; in this occasion, there have been further debates around the possibility of deploying the MP-APP during the 2016 earthquake drill; contacts were taken for a future meeting in early 2016.

8.4 Educational tool

Thanks to its user-friendly characteristic, the MP-APP could be easily used in school curricula (i.e. national and EU level) for what concerns activities related to risk prevention/natural disasters/etc.

FHFRS for instances is engaged in promoting the MP-APP within the ERASMUS+ project "e –PPR: E-Learning to Prepare for Natural Disasters" – www.e-ppr.eu . The project, in which FHFRS acts as partner, aims to create on-line training modules, addressed especially to the young public, that educate young citizens on issues related to natural disasters prevention and response. In fact, according to the feedbacks received from the MAppERS piloting sessions, the MP-APP has a great potential for engaging the young-public, thanks to its "smart" technological features. FHFRS aims to capitalize on these features as a mean to bring the younger generations closer to issues related to natural risk prevention, preparedness and emergencies responses.

8.5 Data integration/communication for rescue overview systems

As highlighted by partners' inputs, the MP-APP has a great potential for what concerns data gathering and analysis for the integration in existing "situational pictures". The MP-APP would need a further deployment in terms of database management and could be further developed so to be able to:

- Give a preliminary coherent data analysis (i.e. by linking all the imputed data in a synthetic table);
- Communicate with other data gathering systems so to directly feed imputed data in larger "situational pictures".

8.6 Liaison Projects and Initiatives

The MAppERS consortium has identified projects and initiatives (i.e. both concrete projects and specific categories) in which the MP-APP could be further exploited in the period following the official project closure, at the following levels:

- Local and regional – project countries;
- National - project countries;
- Transnational/European.

8.6.1. Examples of projects and initiatives

8.6.1.1. ECOSTRESS Project

The ECOSTRESS Project (www.ecostress.eu) focuses on the search of better-integrated strategies through the strengthening of the risk prevention and disaster management cycle of coastal zones. The project is co-funded by DG ECHO – Civil Protection Financial Instrument, and is developed by the following project consortium: EUCENTRE, (IT) - Lead Partner, AFPCN, (FR), DELTARES, (NH) and ISIG   -   Institute   of International Sociology of Gorizia (IT).

The MP-APP has already been presented to the project consortium during the project Conference " Workshop ECOSTRESS - From EU Tools to Local Practices", where the partners, together with MAPPERS Lead Partner

debated on future prospects for liaisons between the two projects, with the idea of potentially merging vulnerability modelling with crowdsourcing technologies.

8.6.1.2. BLUEWIN Project

The BLUEWIN Project, financed by the EACEA Europe for Citizens Programme, by means of the Town Twinning measure, will be developed in Zadar (HR) in spring 2016. The project foresees one week of training activities around environmental and natural risk issues, for 280 high-school and university students, from Italy, Montenegro, UK, Slovenia and Croatia. The MP-APP will be further experimented in its potential during the training activities, as tool reporting areas in immediate need of natural protection (i.e. cleaning).

8.6.1.3. ZONeSec Project

The project, co-funded by the EU FP7, aims to address the ever-growing need for efficient monitoring of Widezones, by means of an EU framework-approach to surveillance, that guarantees technological excellence and cost-efficiency (www.zonesec.eu).

The project deals with different piloting scenarios of critical infrastructure surveillance patterns, that span from border unauthorized entrances to water and oil transnational gas pipelines.

As part of the ZONeSEC Consortium, ISIG has introduced to project partners the MAppERS App, for feedback and insights on potential future deployments.

The experts' feedbacks relate to the potential of the MP-APP for reporting activities, undertaken by expert surveillance stakeholders, such as law-enforcement members.

8.7 Target audience for the exploitation

The MAPPERS Exploitation Plan identifies the following categories of target audience, as highlighted by the inputs of the project partners:

8.7.1 First level stakeholders

- European Commission/DG –ECHO;
- Local and central authorities of the project countries;
- Civil Protection services and mechanisms of the project countries;
- CSOs and NGOs involved in the field of volunteering, in the project countries;
- Education and training institutions (i.e. schools, high-schools, specialized training centers, etc);
- Research institutions involved in IT services for risk mitigation, in the project countries.

8.7.2 Second level stakeholders

- EU institutions and agencies;
- Local and central authorities at EU level;
- Civil Protection services and mechanisms at EU level;
- CSOs and NGOs involved in the field of volunteering, at EU level;
- Education and training institutions (i.e. schools, high-schools, specialized training centers, etc.), at EU level;
- Research institutions involved in IT services for risk mitigation, at EU level.

8.8 Intellectual property regulations management

All information/knowledge/deliverable produced within the MAppERS project represents the intellectual property of the MAppERS Consortium and is subject to the EC Visibility and Publicity regulations (Art II.8 of the Grant Agreement).

Further use, distribution or reproduction of the project outputs/deliverables must be agreed upon with the MAppERS Consortium, and comply with the EC regulations provided in Art II.8 of the Grant Agreement.

Abbreviations - Acronyms

DBMS - Database Management Systems
DoW - Document of Work
DRR - Disaster Risk Reduction
EAB - End Users Advisory Boards
GUI - Graphical User Interface
MA - Mobile App Android
MP-APP - MAppERS Application
MP-C - MAppERS Citizens module
MP-V - MAppERS Volunteers module
OS - Operating System
PIR - Post Implementation Review
SA - Smartphone Application
SDK - Software Development Kit
SWOT - Strength Weaknesses Opportunities Threats analysis
TVFB - Tammisalo Voluntary Fire Brigade
WA - Web Application

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